Dispersion in the SERS Enhancement with Silver Nanocube Dimers

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SUPPORTING INFORMATION

Data on the dependence of the SERS signal on laser polarization.

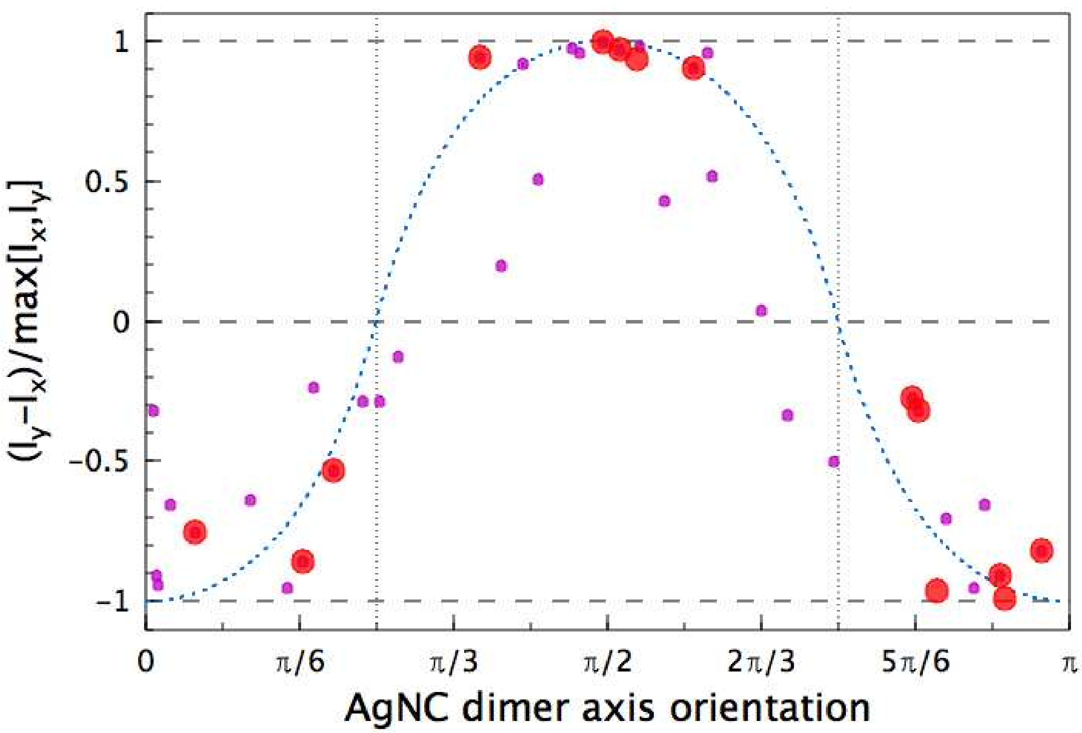


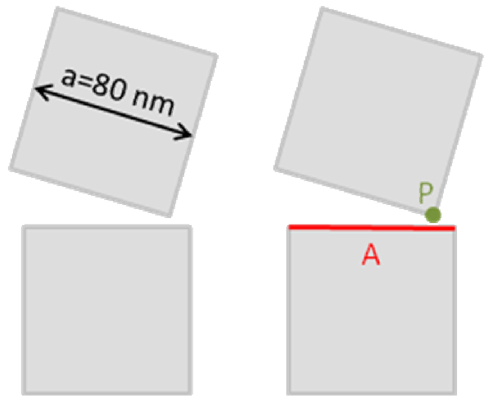
Figure S1. SERS signal anisotropy defined as $(I_y-I_x)/max[I_x,I_y]$, where I_x and I_y are the SERS signal intensity with the incoming laser radiation linearly polarized parallel to the x-axis and the y-axis of the SERS substrate, respectively. The dimer axis orientation is given as its angle with respect to the x-axis of the substrate. Large red circles correspond to data from dimers with strong SSEF and small magenta circles correspond to data from dimers with intermediate SSEF values. The dashed blue curve shows the theoretical values. 42 data points were included in the graph.

Procedure for assigning the dimer type as EE, FE or FF based on geometrical factors.

General: All dimers consist of two nanocubes, separated by less than 10nm. The average edge length of the cubes is 80nm.

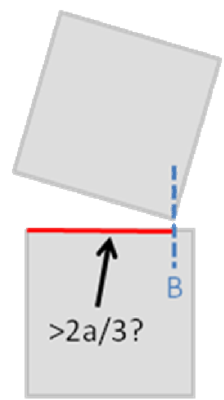
Consider the projection of a dimer onto the surface of the substrate, indicated in the schematic below:

(1) Identify the corner of one cube that is closest to a face of the adjacent cube. Mark the corner point P, and draw a line A along the projection of the face. (Scheme 1)



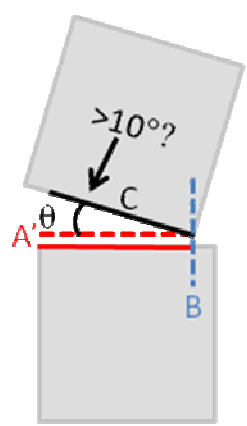
SCHEME 1

(2) Draw a line B through point P perpendicular to A. Line B splits A into two segments. Is one segment longer than $2/3$ of the cube edge? (Scheme 2)



SCHEME 2

(2a) **If YES**: Consider the longer of these two segments. Identify the face of the cube containing point P that is on the same side of line B as this segment. Draw a line C along the projection of the face. Draw a line A’ through point P parallel to A. Is the angle θ between A’ and C larger than 10°? (Scheme 3)

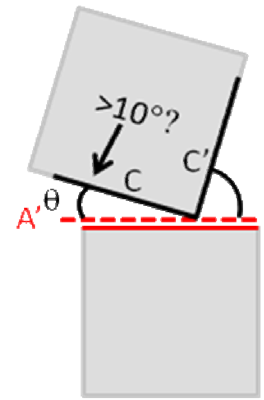


SCHEME 3

Assignment:

One segment > 2a/3 $\theta > 10°$	EE
One segment > 2a/3 $\theta < 10°$	FF

(2b) **If NO**: Identify the faces of the cube containing point P. Draw lines C and C' along the projections of the faces. Draw a line A' through point P parallel to A. Is the angle θ between A' and C (or C') smaller than 10° or larger than 80°? (Scheme 4)



SCHEME 4

Assignment:

Both segments < 2a/3 θ < 10° or θ > 80°	FF
Both segments < 2a/3 10° < θ < 80°	FE